

CLAIMS

1. A process for the production of a porous matrix, the process comprising the steps of:
 - bringing a first phase into a fluid state,
 - introducing a second phase into the first phase,
 - mixing the first and second phases to ensure that the required distribution of the second phase through the first phase is achieved, and,
 - allowing the first phase to solidify, with the second phase therein.
2. A process according to claim 1, in which the first phase is tacky.
3. A process according to Claim 1 or Claim 2, in which the first phase coats the second phase.
4. A process according to any one of claims 1 to 3, in which the first phase transforms from a fluid state to a solid or semi-solid state on the change of a single parameter.
5. A process according to claim 4, in which the parameter is temperature, pH, introduction of a setting agent, presence/absence of light, ultra-violet curing infra-red curing, or under anaerobic conditions.
6. A process according to any preceding claim, in which the second phase is a solid phase.
7. A process according to any one of claims 1 to 5, in which the second phase is a liquid phase.
8. A process according to claim 7, in which the liquid phase is an emulsion or suspension of particulate material.

9. A process according to claim 8, in which the particulate material is porous.
10. A process according to claim 8 or claim 9, in which the particulate material is porous and in which the porosity of the particle is of between 10 – 97%
11. A process according to any preceding claim, in which cells are added to one phase.
12. A process according to claim 11, in which the cells are added to the second phase.
13. A process according to any preceding claim, in which first and second phases are similar materials with different solidifying properties.
14. A process according to any preceding claim in which the phases comprise polymers.
15. A process according to claim 14, in which the polymers are selected from poly(α -hydroxyacids), polylactic or polyglycolic acids, poly-lactide poly-glycolide copolymers, poly-lactide polyethylene glycol (PEG) copolymers, polyesters, poly (ϵ -caprolactone), poly (3-hydroxybutyrate), poly (s-caproic acid), poly (p-dioxanone), poly (propylene fumarate), poly (ortho esters), polyol/diketene acetals addition polymers, polyanhydrides, poly (sebacic anhydride) (PSA), poly (carboxybiscarboxyphenoxyphenoxyhexane) (PCPP), poly [bis (p-carboxyphenoxy) methane] (PCPM), copolymers of SA, CPP and CPM poly (amino acids), poly (pseudo amino acids), polyphosphazenes, derivatives of poly [(dichloro) phosphazene], poly [(organo) phosphazenes] polymers, polyphosphates, polyethylene glycol polypropylene

block co-polymers, natural polymers, silk, elastin, chitin, chitosan, fibrin, fibrinogen, polysaccharides (including pectins), alginates, collagen, poly (amino acids), peptides, polypeptides or proteins, co-polymers prepared from the monomers of these polymers, random blends of these polymers or mixtures or combinations thereof.

16. A process according to claim 14 or claim 15, in which the polymer is biodegradable.
17. A process according to any one of claims 14 to 16, in which the polymer is cross-linked.
18. A process according to any one of the preceding claims, in which a plasticizer is added to one or both of the phases.
19. A tissue scaffolding matrix, the matrix comprising a first, carrier phase and a second, suspended phase contained within the first phase, the matrix further comprising cells.
20. A tissue scaffolding matrix prepared according to the process of any preceding claim.
21. A tissue scaffolding matrix according to claim 19 or claim 20, in which the second phase comprises the cells.
22. A tissue scaffolding matrix according to any one of claims 19 to 21, in which the cells are seeded into a particulate material entrained or carried within the second phase.
23. A tissue scaffolding matrix according to any one of claims 19 to 22, in which the cells are animal cells.

24. A tissue scaffolding matrix according to any one of claims 19 to 23, in which the cells are mammalian cells.
25. A tissue scaffolding matrix according to any one of claims 19 to 24 in which the cells are human cells.
26. A tissue scaffolding matrix according to any one of claims 23 to 25, in which the cells are bone, osteoprogenitor cells, cardiovascular cells, endothelial cells, cardiomyocytes, pulmonary or other lung cells, gut or intestinal cells, cartilage, muscle, liver, kidney, skin, or specialised cells such as placental, amnionic, chorionic or foetal cells, stem cells, chondrocytes, or reprogrammed cells from other parts of the body such as adipocytes reprogrammed to become cartilage cells.
27. A matrix according to any one of claims 19 to 26, in which the matrix further comprises factors useful for the promotion of tissue growth and development.
28. A matrix according to any one of claims 19 to 27, in which the matrix further comprises epidermal growth factor, platelet derived growth factor, basic fibroblast growth factor, vascular endothelial growth factor, insulin-like growth factor, nerve growth factor, hepatocyte growth factor, transforming growth factors and bone morphogenic proteins, cytokines including interferons, interleukins, monocyte chemotactic protein-1 (MCP-1), oestrogen, testosterone, kinases, chemokines, glucose or other sugars, amino acids, calcification factors, dopamine, amine-rich oligopeptides, such as heparin binding domains found in adhesion proteins such as fibronectin and laminin, other amines tamoxifen, cis-platin, peptides and certain toxoids

29. A matrix according to any one of claims 19 to 28, in which the matrix further comprises drugs, hormones, enzymes, antibiotics, nutrients or other therapeutic agents or factors or mixtures thereof in both phases.
30. A matrix according to any one of claims 19 to 27, in which each phase of the matrix comprises different drugs, hormones, enzymes, antibiotics, nutrients or other therapeutic agents or factors or mixtures thereof.